WHAT IS CLAIMED IS:

1. A method for manufacturing a glass base material, which is a base material of an optical fiber, comprising:

forming a core of said glass base material;

said forming said core including:

accumulating glass particles on a starting rod to form a porous glass soot;

sintering said porous glass soot in an atmosphere of mixed gas containing fluorine-compound gas to form a GI type refractive index profile, the refractive index of which gradually decreases with a distance from a center of said core; and

forming a clad of said glass base material around said core.

2. A method as claimed in claim 1, wherein:

said sintering said porous glass soot controls a fluorine-compound gas content in said atmosphere of said mixed gas and a sintering speed for sintering said porous glass soot to form said GI type refractive index profile.

3. A method as claimed in claim 2, further comprising:

recognizing a density of said porous glass soot;

determining said fluorine-compound gas content in said mixed gas based on said recognized density of said porous glass soot; and

determining said sintering speed based on said recognized density of said porous glass soot; wherein:

said sintering sinters said porous glass soot according to said determined fluorine-compound gas content and said determined sintering speed.

4. A method as claimed in claim 1, wherein said accumulating said glass particles forms said porous glass soot having a density in a range from 0.15 g/cm^3 to 1.0 g/cm^3.

5. A method as claimed in claim 4, wherein said accumulating said glass particles forms said porous glass soot having a density in a range from 0.15 g/cm^3 to 0.4 g/cm^3.

6. A method as claimed in claim 2, wherein said sintering said porous glass soot controls said fluorine-compound gas content within a range from 0.1 Vol% to 10 Vol%.

7. A method as claimed in claim 2, wherein said sintering said porous glass soot controls said sintering speed within a range from 5 mm/min to 10 mm/min.

8. A method as claimed in claim 1, wherein said accumulating said glass particles hydrolyzes and accumulates silicon tetrachloride on said starting rod.

9. A method as claimed in claim 1, wherein said forming said core further includes forming an inner core, a refractive index of which is substantially the same as a refractive index of pure quartz, inside said core.

10. A glass base material, which is a base material of an optical fiber, comprising:

a fluorine-doped core which has a GI type refractive index profile that gradually decreases with a distance from a center of said fluorine-doped core; and

a fluorine-doped clad having a substantially uniform refractive index profile.

11. A glass base material as claimed in claim 10, further comprising: an inner core, a refractive index of which is substantially the same as a refractive index of pure quartz, inside said fluorine-doped core.

12. A glass base material as claimed in claim 11, wherein the highest refractive index of said fluorine-doped core is smaller than said refractive index of said inner core.

13. A glass base material as claimed in claim 12, wherein a refractive index of said fluorine-doped clad is smaller than the lowest refractive index of said fluorine-doped core.

14. A glass base material as claimed in claim 11, wherein an absolute value of a difference of a refractive index between said inner core and said pure quartz is 0.001 or smaller.

15. An optical fiber, comprising:

a fluorine-doped core which has a GI type refractive index profile that gradually decreases with a distance from a center of said fluorine-doped core; and

a fluorine-doped clad having a substantially uniform refractive index profile.

16. An optical fiber as claimed in claim 15, further comprising: an inner core, a refractive index of which is substantially the same as a refractive index of pure quartz, inside said fluorine-doped core.

17. An optical fiber as claimed in claim 16, wherein the highest refractive index of said fluorine-doped core is smaller than said refractive index of said inner core.

18. An optical fiber as claimed in claim 17, wherein a refractive index of said fluorine-doped clad is smaller than the lowest refractive index of said fluorine-doped core.

19. An optical fiber as claimed in claim 16, wherein an absolute value

value of a difference of a refractive index between said inner core and said pure quartz is 0.001 or smaller.

20. An optical fiber as claimed in claim 15, wherein said optical fiber is an optical fiber for a high power laser.

21. An optical fiber as claimed in claim 20, wherein said high power laser is a YAG laser.